

ABSTRACT

A method for making an improved silicon-germanium layer on a substrate for the base of a heterojunction bipolar transistor is achieved using a two-temperature process. The method involves growing a seed layer at a higher temperature to reduce the grain size with shorter reaction times, and then growing an epitaxial Si-Ge layer with a Si cap layer at a lower temperature to form the intrinsic base with low boron out-diffusion. This results in an HBT having the desired narrow base profile while minimizing the discontinuities (voids) in the Si-Ge layer over the insulator to provide good electrical contacts and uniformity to the intrinsic base.